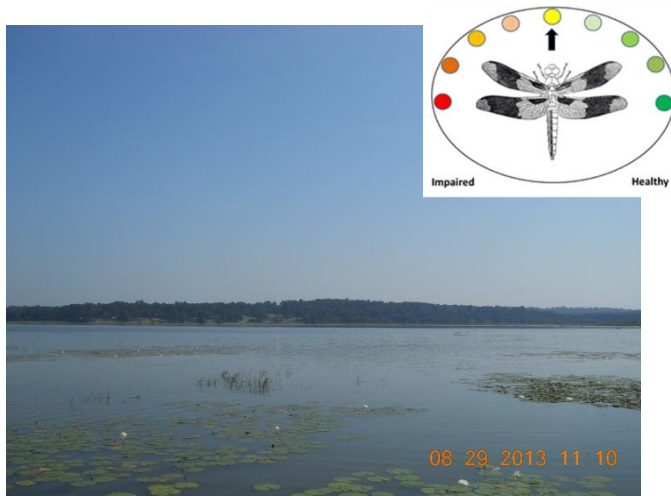


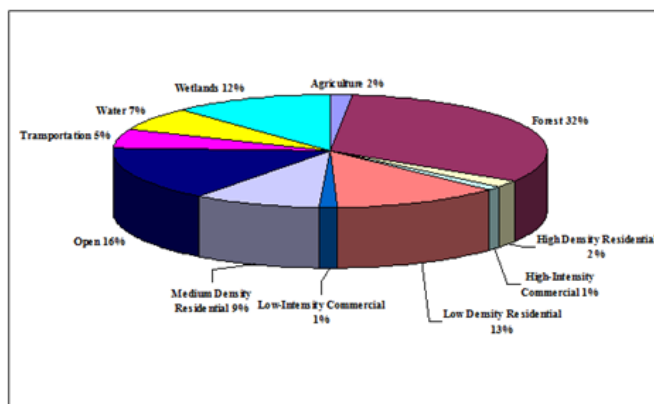
## Waterbody: Lake Jackson



## Basin: Lake Jackson

Lake Jackson is an approximately 4000 acre, shallow, flat bottomed, prairie lake with two major sinkholes and is located north of the City of Tallahassee. Lake Jackson is a valuable biological, aesthetic, and recreational resource of Leon County and was designated (along with the neighboring Lake Carr and Mallard Pond) as an Aquatic Preserve in 1974 for the primary purpose of preserving and maintaining the biological resources in their natural condition.

As shown in the following pie chart, approximately 33% of land use in the 27,262 acre Lake Jackson Basin is residential, commercial, agriculture, or transportation. Increases in stormwater runoff, and waterbody nutrient loads can often be attributed to these types of land uses.



## Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. Water quality standards are designed to protect designated uses of the waters of the state (*e.g.*, recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

## Methods

Surface water and sediment sampling was conducted to determine the health of Lake Jackson and met the collection and analysis requirements of the Florida Department of Environmental Protection (FDEP).

## Results

### Nutrients

Low water levels caused by drought and sinkhole activity meant certain water quality stations could not be sampled during some months. After Tropical Storm Fay (August 2008), Lake Jackson water levels reached full pool conditions; however, subsequent drought conditions lowered lake levels to where staff was unable collect water chemistry samples in 2012 and the first quarter of 2013. Objective results of nutrient concentration continued to be skewed by water level fluctuations. The effects of reflooding and drought will continue to be documented.

The nutrient thresholds and results are found in Table 1. According to FDEP requirements, Numeric Nutrient Criteria (NNC) (expressed as an annual geometric mean) cannot be exceeded more than once in a three year period. Chlorophyll *a* levels

were exceeded in 2009 and 2011 while total phosphorus levels were exceeded in 2008.

**Table1.** FDEP's chlorophyll *a*, total nitrogen and phosphorus criteria for lakes applied to Lake Jackson. Results in bold signify exceedances of the State criteria. Due to low water the numeric nutrient criteria data requirements could not be calculated for years 2012-2013.

<b>Clear Lake, Low Alkalinity</b>	<b>Chlorophyll-<i>a</i> 6.0 µg/L</b>	<b>Total Nitrogen Threshold 0.51-0.93 mg/L</b>	<b>Total Phosphorus Threshold 0.01-0.03 mg/L</b>
<b>2004</b>	2.2	0.33	0.01
<b>2005</b>	3.2	0.29	0.03
<b>2006</b>	3.0	0.63	0.03
<b>2007</b>	2.1	0.77	0.03
<b>2008</b>	5.7	0.60	<b>0.04</b>
<b>2009</b>	<b>8.4</b>	0.49	<b>0.02</b>
<b>2010</b>	3.2	0.58	0.02
<b>2011</b>	<b>6.9</b>	<b>0.61</b>	<b>0.02</b>
<b>2012-2013</b>	-	-	-

As mentioned before, staff was unable to collect water chemistry samples in 2012 and the first quarter of 2013, so the numeric nutrient criteria data requirements were not met for either year. However, it should be noted that chlorophyll *a* levels were elevated at station J05 during the second (20.8 µg/L) and third quarters (28.2 µg/L) of 2013, while station J03 chlorophyll *a* levels were elevated during the third quarter (47.8 µg/L) of 2013. Lake levels were still very low during the time of sampling, so concentrated nutrients and warm waters (temperatures were near 30 degrees Celsius at the time of sampling) fueled the algal blooms that these numbers represent.

### *Dissolved Oxygen*

As Figure 1 shows, several Lake Jackson stations showed percent dissolved oxygen (DO) saturation values that did not meet Class III water quality criteria. This was not unexpected, since the Lake Jackson stations are shallow stations normally covered with vegetation, which prevents rapid water exchange with the larger area of the lake. Plant respiration (samples were often taken in the morning hours), in addition to organic rich sediments, also contributed to the low DO saturation values.

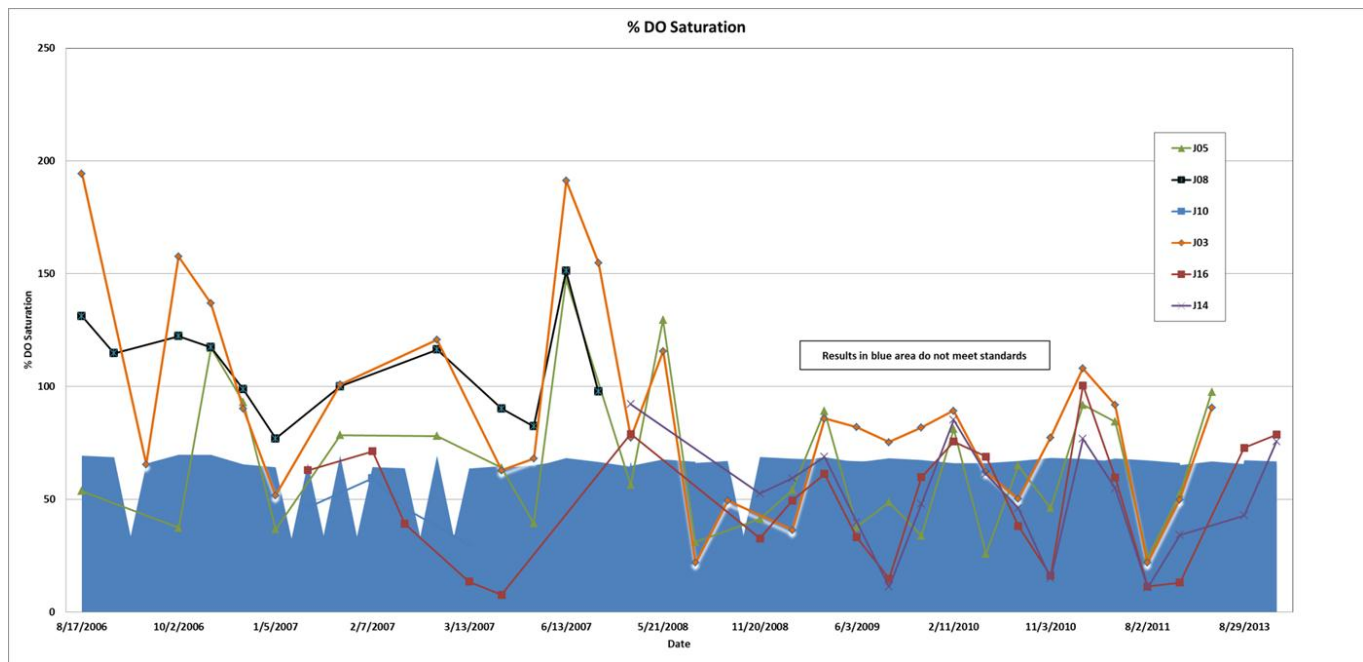
### *Metals*

Copper levels exceeded Class III water quality criteria during the 4<sup>th</sup> quarter at station J05 (southeast Lake Jackson) and the Lexington Tributary station (station 26) that flows into this portion of Lake Jackson. The source(s) of copper are unknown at this time.

[Click here for more information on metal levels in Leon County waterbodies.](#)

### *Other Parameters*

Other water quality parameters appear to be normal for the area and no other impairments were noted.



**Figure 1.** Dissolved Oxygen Percent Saturation results for Lake Jackson.

## Conclusions

Based on ongoing sampling, Lake Jackson NNC chlorophyll *a* levels were exceeded in 2009 and 2011 while total phosphorus levels were exceeded in 2008. Chlorophyll *a* levels were elevated at station J05 during the second and third quarters of 2013, while station J03 chlorophyll *a* levels were elevated during the third quarter of 2013. Lake levels were still very low during the time of sampling, so concentrated nutrients and warm waters fueled the algal blooms that these numbers represent. Ongoing sampling showed percent dissolved oxygen (DO) saturation values did not always meet Class III water quality criteria. This was not unexpected, since the Lake Jackson stations are shallow stations normally covered with vegetation, preventing rapid water/atmospheric exchange. Plant respiration and organic rich sediment also contributed to low DO saturation values. Copper levels exceeded Class III water quality criteria during the 4<sup>th</sup> quarter at station J05. The source(s) of copper are unknown at this time.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

## Contact and resources for more information

[www.LeonCountyFL.gov/WaterResources](http://www.LeonCountyFL.gov/WaterResources)

[Click here to access the results for all water quality stations sampled in 2013.](#)

Johnny Richardson, Water Resource Scientist  
(850) 606-1500

[Richardsonjo@leoncountyfl.gov](mailto:Richardsonjo@leoncountyfl.gov)